Biochemistry Lecture (CHM 338) Fall 2016 12/5 Monday Final Exam Dr. Hahn Exam # _____

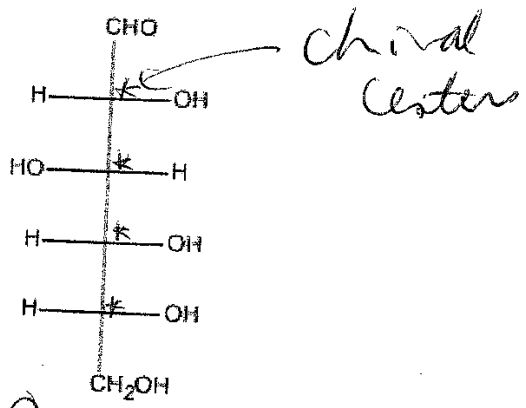
Name Key (print) Name _____ (sign)

Please show work for partial credit and full credit on the Long Answers and in some of the Short Answer Questions. Multiple choice questions have no partial credit. Please write anything you want graded legibly. If you run out of space, please continue on the empty back pages but clearly label where the remaining answer can be found. (If I can't find your answer or cannot read it, I obviously cannot grade it). Return your entire exam including the periodic table. (Please count your exam pages and make sure there are 9 real pages + handouts – periodic, amino acids, genetic code, etc.)

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question. (2 pts each, 24 pts total)

1) In naturally occurring unsaturated fatty acids the double bonds are: 1) A
(A) all cis B) all trans C) both cis and trans D) neither cis nor trans

2) In the Fisher projection formula shown, how many chiral centers is in the molecule? 2) A



(A) 4 B) 6 C) 5 D) 3

3) A correct set of complimentary base pairs in DNA are: 3) B
A) AU (B) GC C) AG D) TC

4) Which of the following correctly describes exons and introns? 4) D
A) Exons are noncoding sections of DNA and introns are coding sections.
B) In order to code for a protein both an exon and an intron are necessary.
C) Both exons and introns code for proteins, but they code for different types of proteins.
(D) Exons are coding sections of DNA and introns are noncoding sections.

5) How many monosaccharides are connected to each other in a disaccharide? 5) B
A) 1 (B) 2 C) 3 D) 4

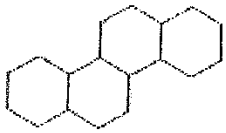
6) The abbreviation ATP stands for
(A) adenosine triphosphate.
B) alanine triphosphate.
C) adenosine tetraphosphate.
D) anabolic triple phosphate.
E) adenine + three phosphates.

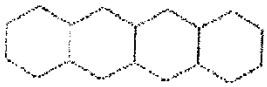
6) A

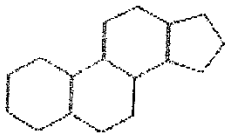
7) Which of the following structural arrangements is the steroid structure?

7) D

A) 

B) 

C) 

(D) 

8) What type of bonding holds the double strand of DNA together?
(A) Hydrogen bonding
B) Covalent bonding
C) Ionic bonding
D) None of these

8) A

9) Which of the following nitrogenous bases is found only in RNA?
A) Adenine B) Cytosine C) Thymine (D) Uracil

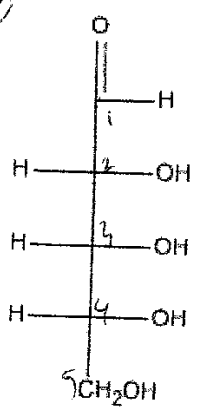
9) D

10) Metabolism is composed of which process(es)?
A) anabolism
B) catabolism
C) oncologism
(D) both A and B
E) both B and C

10) D

11) Which of these molecules is an aldopentose? 11) A

A)



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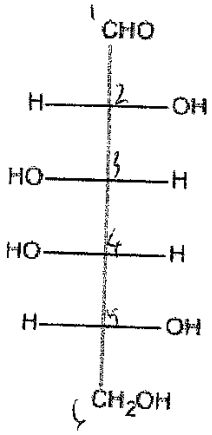

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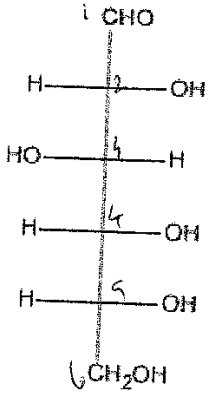
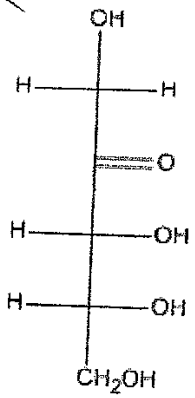


D)



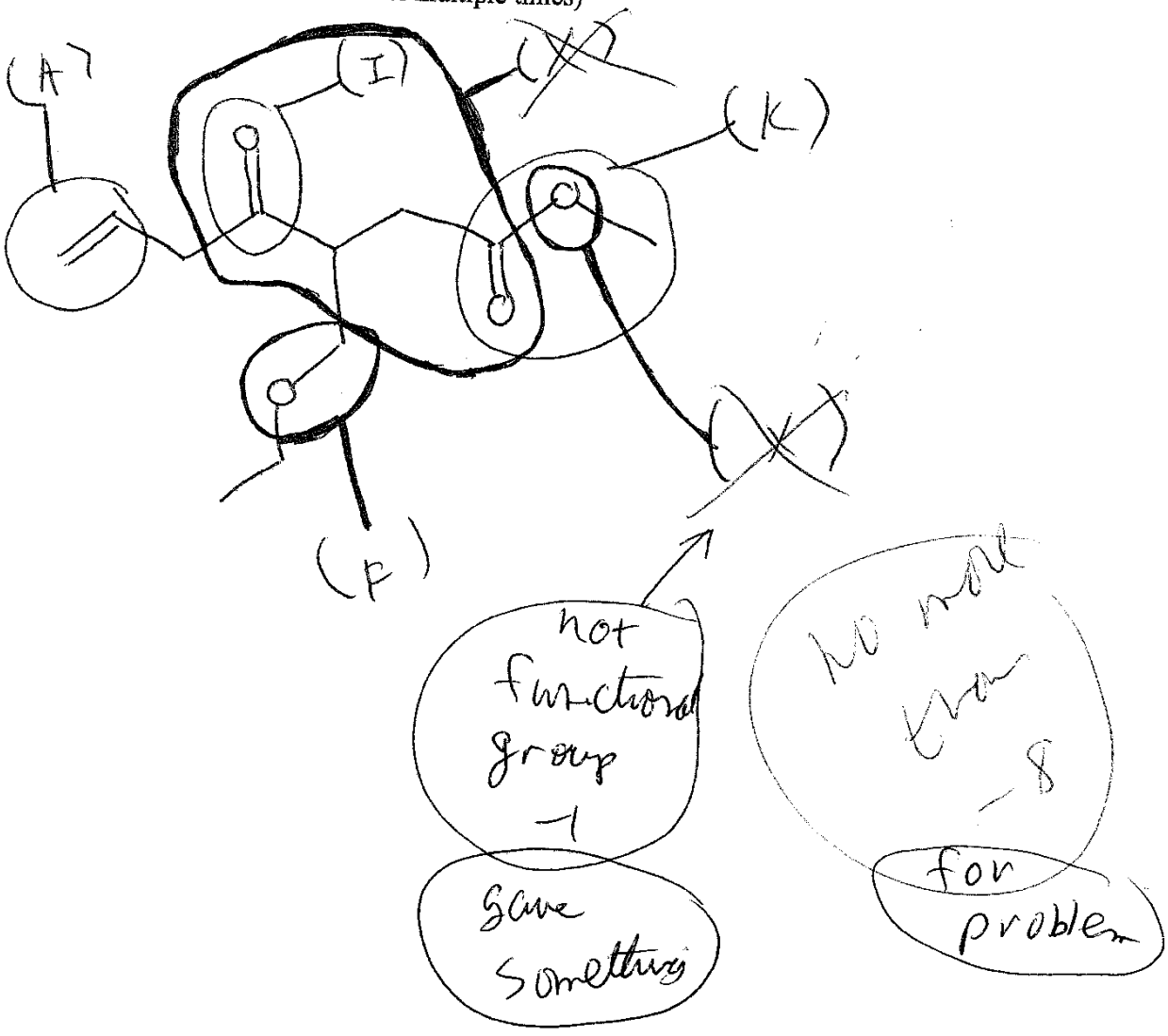
12) The electronegativity of elements on the periodic table increases going ___ a column and to the ___ in each row. (hint: where is F) 12) A

A) up; right B) up; left C) down; right D) down; left

Part II: Short Answers (42 pts)

1. Given the following molecule, fill in the parenthesis with the letter of the functional group. (8 pts total, 2 pts each) (parenthesis may have no letter)

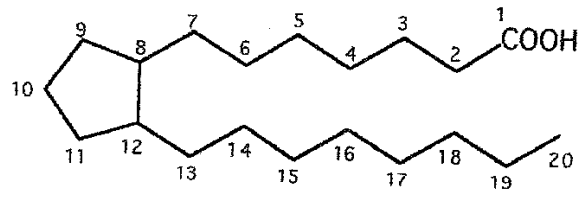
(A) alkene (B) alkyne (C) arene (D) alkyl halide (E) alcohol (F) ether (G) amine (H) aldehyde (I) ketone (J) carboxylic acid (K) ester (L) amide (M) acid halide (N) acid anhydride (You may use the same letter multiple times)



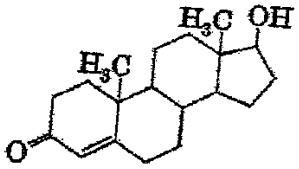
2 What is the 3 letter genetic code for the start of transcription ? (5 pts) AUG
(consult the genetic code sheet)

3. Given the following molecules, match to the name of the structure of the lipid shown.

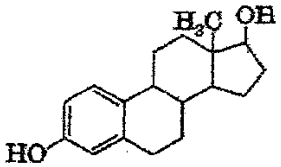
(A) Prostaglandin (B) progesterone (C) testosterone (D) estradiol (E) cortisol (9 pts total, 3 pts each)



A

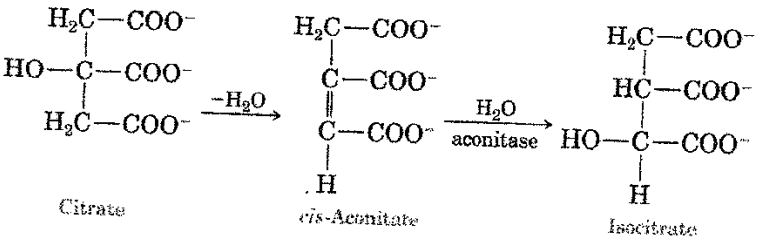


C

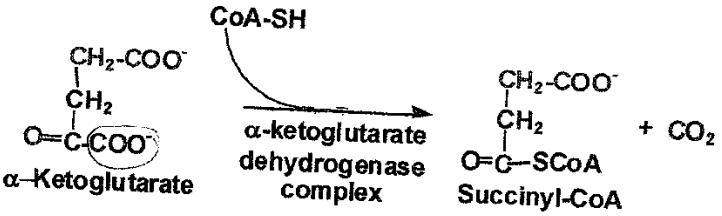


D

4 Given the following reactions match to one of the following (A) reduction reaction (B) isomerization (C) decarboxylation (D) oxidation reaction (each reaction may have more than one correct letter answer) (9 pts total, 3 pts each)



B



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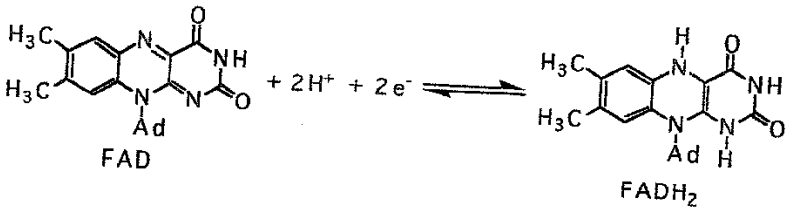
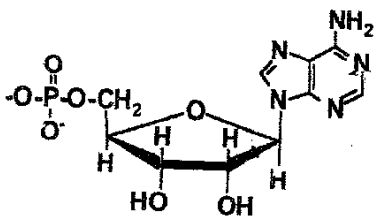
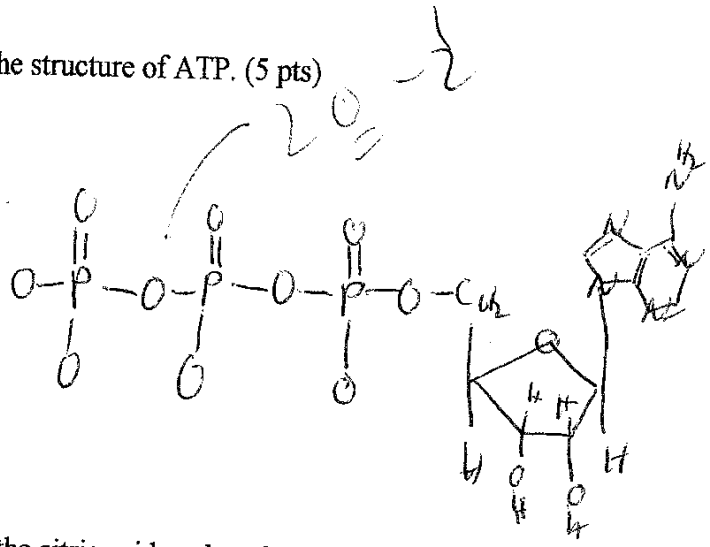


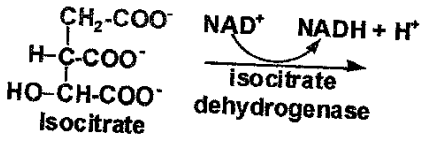
A

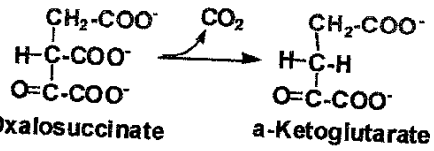
5. Given the following structure of AMP, show the structure of ATP. (5 pts)



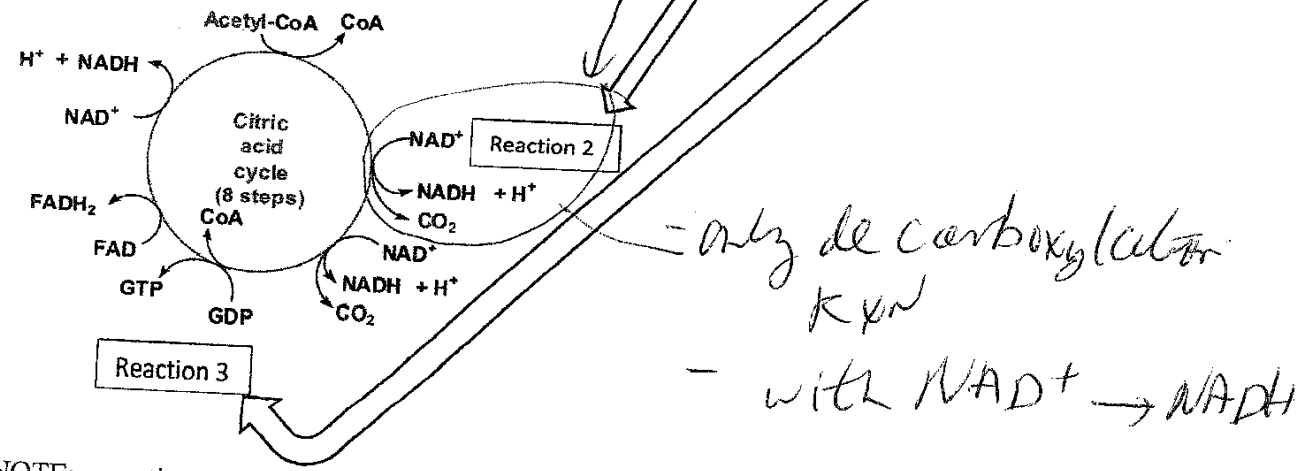


6 Given the following reaction which is a part of the citric acid cycle, where does the reaction fit into the citric acid cycle. Note the numbers which I have labeled the citric acid cycle and put ONE of the numbers to match the reaction shown. (6 pts)





[(reaction 1) (reaction 2) (reaction 3)] **(circle one)** - **note the labeling of the reactions in the citric acid cycle.**

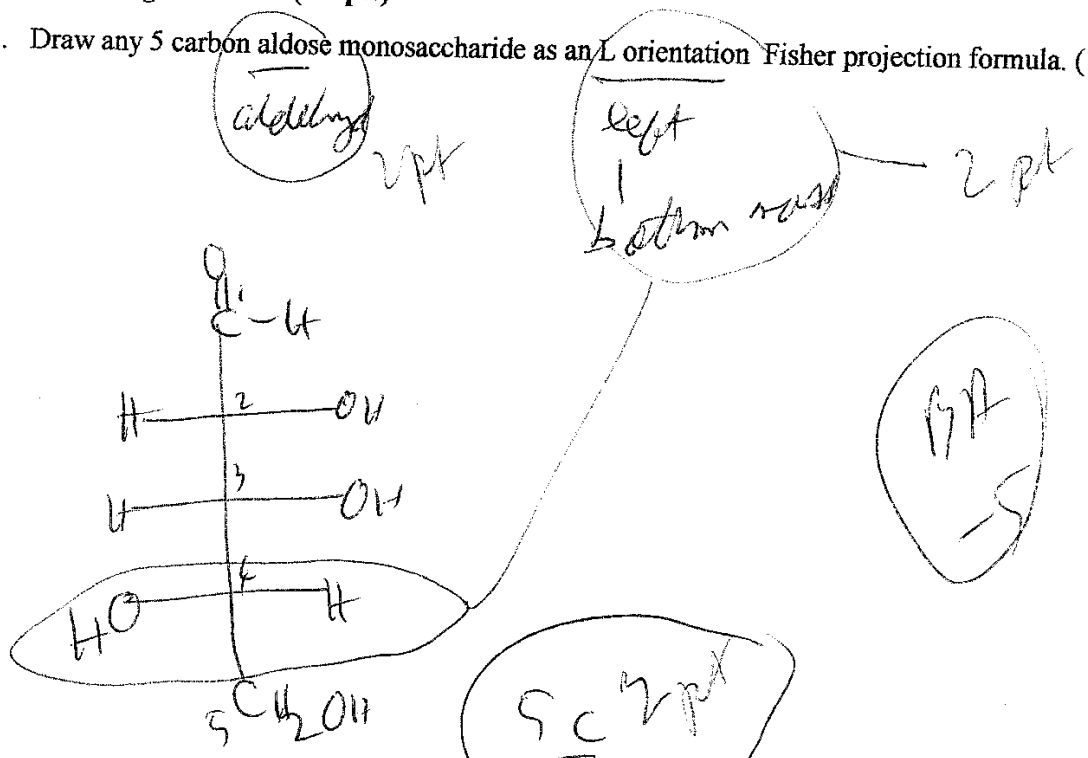


- only de carboxylation KGDH
- with NAD+ → NADH

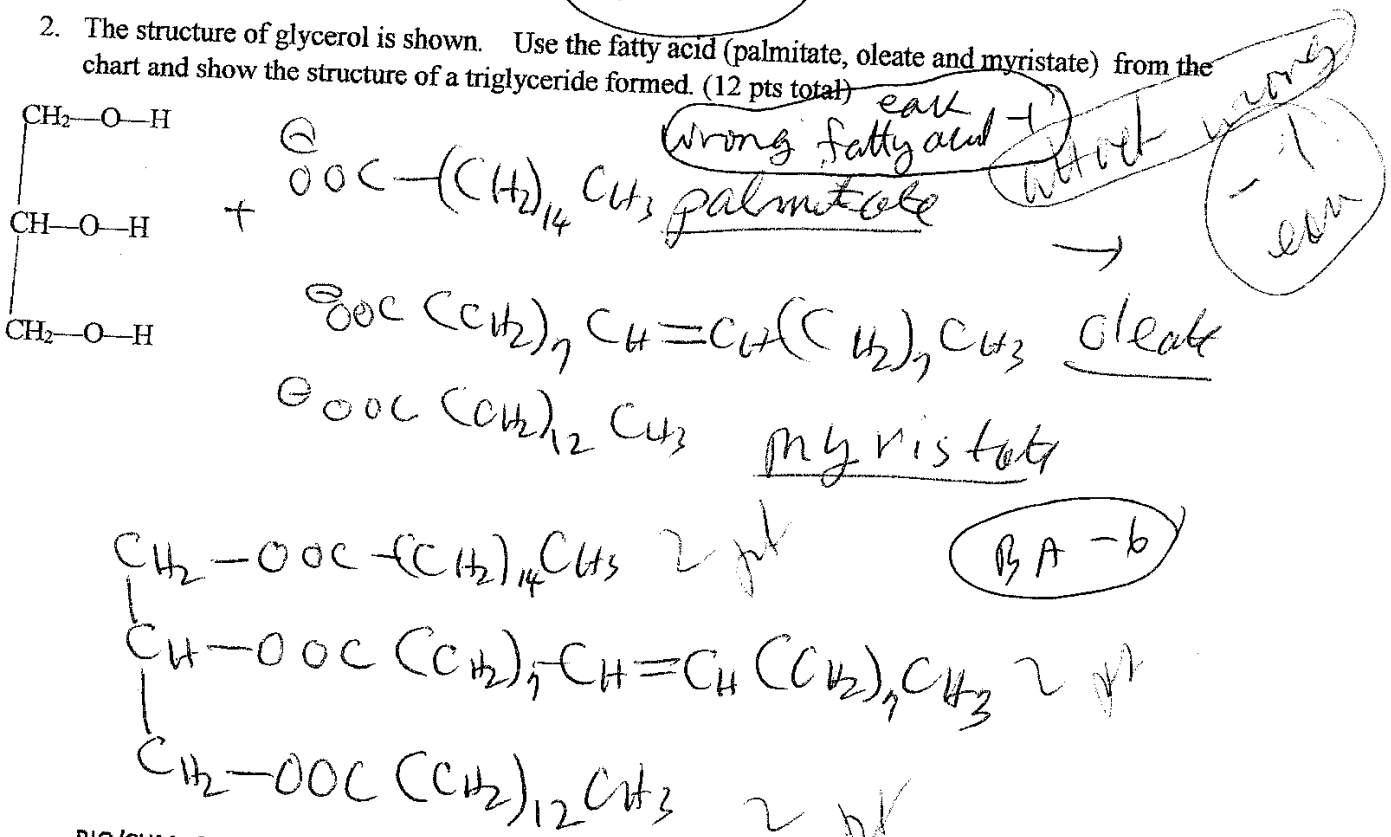
NOTE: reaction numbers do NOT coincide with the reaction # from powerpoint of lecture.

Part III: Long Answers (34 pts)

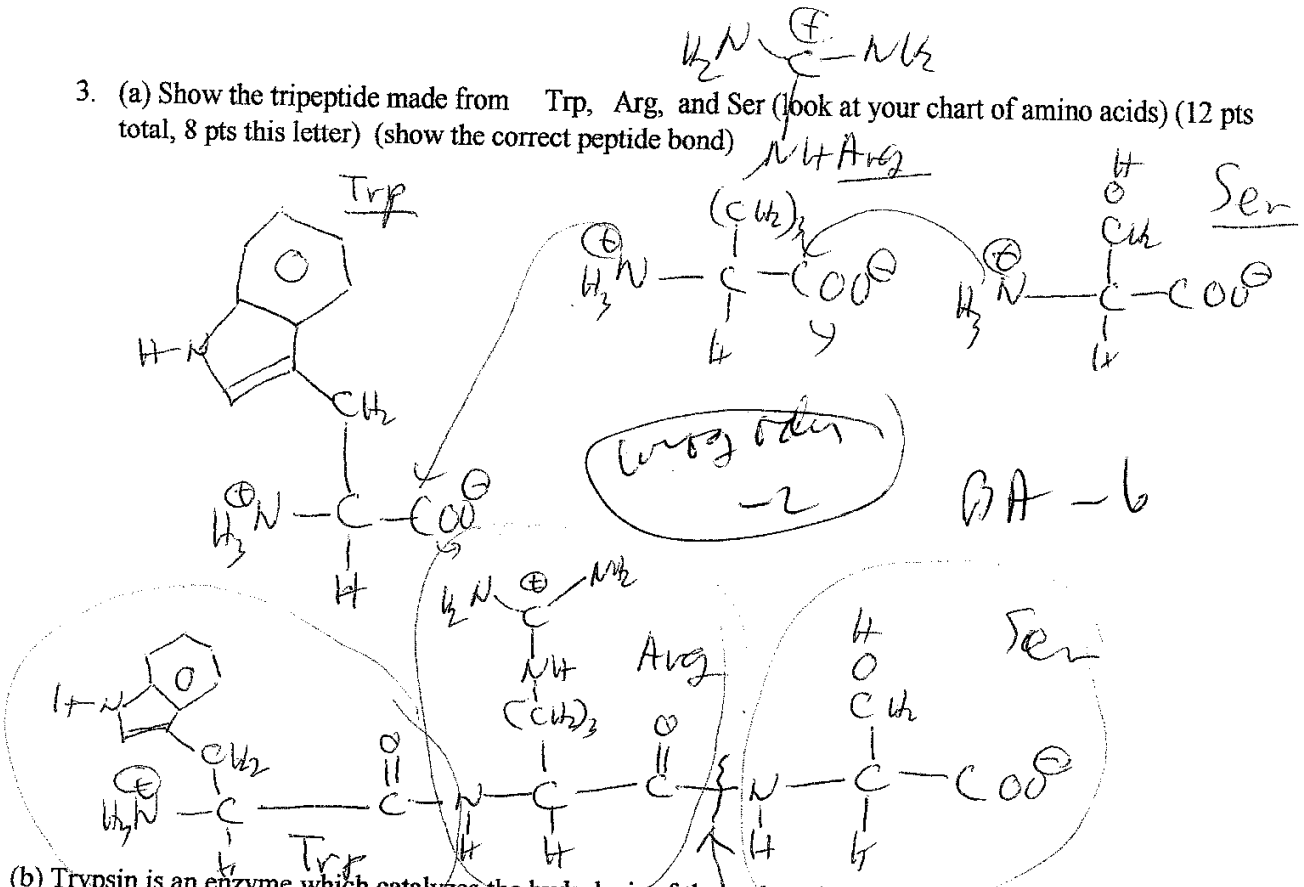
1. Draw any 5 carbon aldose monosaccharide as an L orientation Fisher projection formula. (10 pts)



2. The structure of glycerol is shown. Use the fatty acid (palmitate, oleate and myristate) from the chart and show the structure of a triglyceride formed. (12 pts total)



3. (a) Show the tripeptide made from Trp, Arg, and Ser (look at your chart of amino acids) (12 pts total, 8 pts this letter) (show the correct peptide bond)



(b) Trypsin is an enzyme which catalyzes the hydrolysis of the carboxyl group of lysine and arginine. Show your tripeptide after the tripeptide has been chopped up by the enzyme. (4 pts)